

Brown, Corey D.; Watson, Kyle A.; Lyons, Kevin M.

Studies on lifted jet flames in coflow: The stabilization mechanism in the near- and far-fields.

(English) [Zbl 0980.76098](#)

Flow Turbul. Combust. 62, No. 3, 249-273 (1999).

Summary: This paper presents the results of a parametric study concerning the phenomenon of liftoff of a nonpremixed jet flame. We describe the dependence of liftoff height on jet exit velocity and coflow velocity. It is shown that lifted flames become less sensitive to jet exit velocity as the stabilization point recedes from the burner exit. The results reveal that in cases of extreme liftoff height, increases in jet exit velocity with a constant coflow cause some ethylene flames to stabilize closer to the burner. The success of current theories on lifted flame stabilization in comparison to the experimental results of this study is assessed. We describe the existence of multiple regimes for flame stabilization, incorporating aspects of both premixed and nonpremixed combustion.

MSC:

[76V05](#) Reaction effects in flows

[80A25](#) Combustion

Keywords:

liftoff of nonpremixed jet flame; premixed combustion; coflow; parametric study; stabilization point; lifted flame stabilization; nonpremixed combustion

Full Text: [DOI](#)